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Slogan for 1918

To Help Save **WHEAT:** Sow a Million Acres to **PROSO**

1. Some New Fruits and a Rose

2. Some New Alfalfas all Forage Plants for Dry Uplands

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Brookings, South Dakota

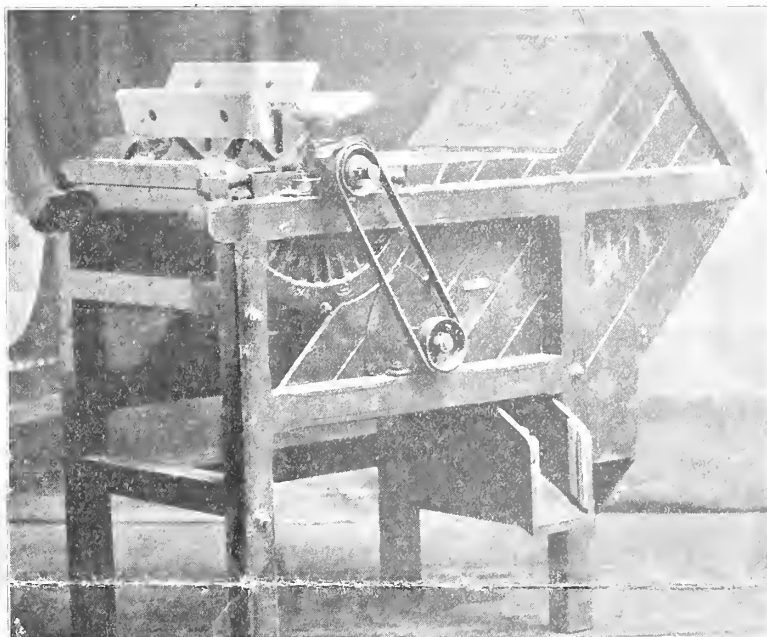
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Save the Wheat, Put Slacker Land to Work Sow a Million Acres to Proso

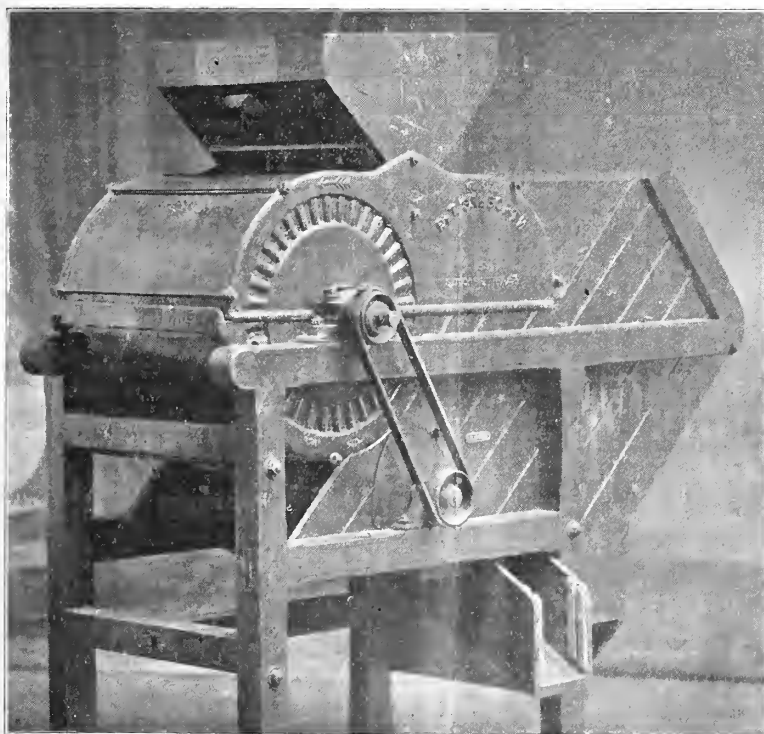
The food situation at the present time demands that every acre of land should be put to work and this includes slacker land, by which I mean low land that dries off too late for corn or any other crop. Proso is a grain millet (*Panicum miliaceum*) found in many colors and varieties in the dry regions of Asia. The grain ripens in 60 days. It may be cut for hay also but the grain crop is the main item. In my bulletin 158 the following were noted as some of the leading varieties: Early Fortune, Manitoba, Black Voronezh, Red Russian, Tambov, Red Lump and Red Orenburg. In my five trips to Russia I have brought over some 32 varieties of Proso.

In the spring of 1917 I published several articles on this subject which were widely disseminated and caused considerable increase in the acreage. In time of war any color of Proso will do but the tendency will be as soon as possible to plant the best white-seeded variety because this color adapts it better for human food according to our present standards. If an occasional white seed escapes the huller, it does not show when used as a breakfast cereal, or in bread.

The exact quantity to sow per acre is not yet standardized; it depends on conditions. On old land full of weed seed, early and thin sowing may be over-topped somewhat by pig weeds, causing difficulty in cutting. Some farmers sow as much as one-half bushel per acre, sowing as shallow as possible, broadcast or with press drill. Destroy all the weeds possible by frequent harrowing until time of sowing. Rather thin seeding will give the largest, plumpest grain. Sow shallow on a firm seed bed, as free as possible from weeds. Some believe that 20 pounds per acre is sufficiently heavy seeding. In 1914 we sowed 5 pounds per acre and harvested 22 bushels. The seed



Proso Huller With Top Removed to Show Mechanism. The Right Speed is About Twelve Hundred Revolutions Per Minute.



PROSO HULLER

weighs up to 60 pounds per bushel. In this vicinity it has been grown on blue grass pasture broken up and seeded at the rate of one-half bushel seed per acre as late as the 13th of July. Under these conditions a Brookings county farmer in 1914 raised a crop of nearly 43 bushels per acre.

Experience the present season indicates that in an emergency the amount of wheat called for in some of the recipes in bulletin 158 of this station may be reduced so that three-fourths instead of one-third of the wheat flour can be saved. In a number of recipes the wheat can be omitted entirely. We hope to have something ready for publication soon on this important subject.

Since the grain needs only 60 days, further south it may be raised successfully after winter wheat is harvested, thus raising two grain crops in one season. Here at Brookings, in the garden of the Department of Horticulture, in 1917 we sowed it as late as July 24 and it got ripe. The main difference was that it grew only knee-high instead of waist-high as usual. Ordinarily the first half of June will probably be preferred. It does not start until the ground is warm. Every available foot of land left in the home garden after early vegetables are removed may be sown to Proso. If the war stops in time for food supplies to be cheaper, the poultry will be glad to harvest it. The seed may be sown broadcast or in narrow rows and cultivated with a wheel hoe. Many millions of people in the dry parts of Asia and eastern Europe live on Proso as a main staple. In the 1890 famine in Russia, Proso bread saved the people from starvation.

HULLING PROSO

In August 1917 the first Proso huller in America was received by the South Dakota State College from Russia. I ordered it from Russia but owing to the submarine campaign it had to be sent via Siberia and Japan, so it was one year and seven months on the way. This machine was exhibited at the South Dakota State Fair at Huron, September 1917. If necessary this machine may easily be duplicated

as it is not elaborately constructed as seen by the cuts. Meanwhile, for home use you can get along without the huller by using an old coffee mill or small hand grist-mill. In such cases the grain may be cleaned by sifting and pouring on a sheet in a current of air.

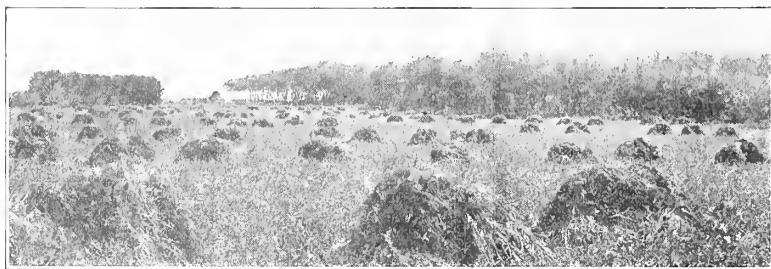
A Grain for the Driest Uplands



HANSEN'S WHITE SIBERIAN PROSO

I found this large white-seeded grain millet among the Kirghiz Tartars near Semipalatinsk, Siberia, in 1913, who grew it extensively as a grain for themselves and their live stock. It is the corner stone of their agriculture in this eight inch rainfall climate, a sure crop in the driest years. For table recipes, see bulletin 158 of this station. A minister in Wyoming writes that the ladies of his parish tried with good results eight of these recipes, including pancakes, muffins, sour milk bread, griddle cakes, rolls and Boston brown bread. A farmer in Pennington County, Western South Dakota, writes that he raised 300 pounds of grain from the pound of seed sent him as a free premium in 1915. The first prize offered by this Society for 1916 was won by D. Betts of Hanson county, Southern South Dakota, who raised 115 pounds of grain from one-half pound of seed. A grain that will furnish good nutritious food for yourself and family and all your live stock in the driest years on the driest uplands of all our western states. A grain that at a pinch can be prepared for the table with a cheap coffee mill and sieve. The past three seasons we have grown a small lot from hand-picked seed, the aim being to eliminate for table use the few grains of other colors mixed with the original stock as it came from Siberia. This is a very slow and tedious work. If you don't believe this, try it. One pound of seed sown in the spring means usually four to five bushels in the fall.

One pound seed of Hansen's White Siberian Proso, grown from seed hand-picked three years in succession, sent as a free premium with 1 annual membership in the South Dakota Horticultural Society.



Field of Hansen's White Siberian Proso, Brookings, S. D., 1914

Some New Apples

The most important orchard problem is a hardy winter apple. After raising fully 10,000 seedlings along many lines of pedigree, I have no seedling that I am sure will be the one needed. The evolution of this apple will probably be a step-by-step process rather than a single step. My present plan is to make many combinations, especially of new and complex pedigree, and to bud from the resulting seedling as soon as possible, even before fruiting. This is to determine the growth in nursery and freedom from blight. These trees are one year old, budded on Siberian Crab apple roots. None of these have fruited, but they appear promising after three years of very severe invasion from blight. They will be of interest only to special experimenters who will understand that the trees may turn out to be only of interest as a curiosity or for ornamental purposes. Trees will be sent out under

preliminary numbers at the rate of \$4.00 per dozen assorted; at least four kinds in one dozen. These are under restrictions as to propagation until they have proven their value.

It will be remembered that Opata, Sapa and others of my hybrid plums were sent out before fruiting.

APPLES ON CRAB APPLE ROOTS

Root-killing of the common apple stocks is now one great source of failure in apple culture in the prairie northwest. It is time that definite experiments were conducted over a wide area with standard varieties of apples grown on the Siberian crab roots. Such trees will be free from root-killing, will attain less size and bear earlier. We have one year budded trees of Hibernial, Anisim, Wealthy and other standard hardy varieties. Also some new varieties including Ivan crab, Dolgo crab, and Giant Wild crab. We wish to put these in the hands of careful people who will plant them, give good care and keep careful records. My impression of preliminary tests here at this station is that such trees may be planted close together and will no doubt be easier to spray.

SPECIAL OFFER:—Trees 50 cents each, \$5.00 per dozen. 25 of these trees will be sent as a free premium with a life membership in the South Dakota State Horticultural Society, or two with an annual membership.

SIBERIAN CRABS FOR APPLE STOCKS

The Siberian Crab Roots for the Apple to Prevent Root-Killing and as a Semi-Dwarf Stock

In bulletin 65 of this station I urged the trial of Siberian roots to prevent the root-killing which is often disastrous at the North. The experiments are still in progress. The seedlings now offered will be suitable for planting out in spring and budding in August. The seedlings offered are from Yellow Siberian, Red Siberian and mixed *Pyrus baccata*. Price of seedlings, 100 for \$1.00.

BREEDING PEARS IMMUNE TO BLIGHT

None of our hybrid pears are available for spring distribution simply because the Japan pear seedlings on which they were budded winter-killed. This definitely determines the fact that we must find a hardier stock than the common Japan pear seedlings. The trees may be raised further south and then when planted at the North should be set deeply and carefully mulched each winter. *Pyrus ussuriensis*, the wild pear of the Pacific coast of Siberia bore a good crop last summer and we have saved every seed. This and *Pyrus ovoidea* will probably be the hardy blight-proof pear stocks for the North. I am endeavoring to secure a supply of this seed for raising stocks.

Tecumseh Plum

Offered for the first time. A fine extra large plum. We have several of this pedigree, which is Shiro crossed with pollen of Surprise. As Shiro is one of Burbank's hybrid Japan plums combining four species, Surprise pollen makes this an amalgamation of five species. It should go south rather than north. Trees one year old buds on sand cherry stock. Each one dollar.

THE HANSEN HYBRID PLUMS

Originated in this Department, they are now represented in a million trees in western orchards and nurseries. They are rapidly finding favor in other states. In propagating for our new orchard we find we have a very few of our selection of assorted trees to spare, one year buds on native plum stock, at three trees for Two Dollars. Keep the Sand Cherry hybrids in bush form with many stems close to the ground. Try renewing the bearing wood by pruning; they bear heavily on one year old wood.

A New Red-Jellied Siberian Crab

DOLGO CRAB

At the annual exhibits of this Department at the South Dakota State Fair many have asked about the remarkably long, conical, intensely bright red crabs we used for making letters. This is one I brought over from my second trip to Russia in 1897. A vigorous productive tree and so far free from blight. Fruit full of juice, jells easily, makes a rich ruby red jelly of beautiful color and excellent flavor.

The one year old trees in nursery are of strong growth with wide spreading forks and strongly shouldered limbs, indicating that they will not split down easily.

Trees one year buds on Siberian crab apple roots, each 50 cents.

IVAN CRAB APPLE

Offered for the first time spring 1916. One of our many seedling crabs. Noteworthy for the calyx segments being absent in the ripe fruit, the same as in the pure Siberian crab (*Pyrus baccata*). Fully one and three-fourths inch in diameter, roundish oblate, good color, marbled with stripes and orange red, acid.

Trees one year buds on Siberian crab roots. Each 50 cents.

Progress With American Wild Crabs

GIANT WILD CRAB

Offered for first time spring 1917. Probably the largest wild crab found so far. Good specimens of the fruit run three inches in diameter and weigh four ounces. A brief note by W. H. Shroyer, of Sherrard, Illinois, calling attention to a large fruited wild crab, appeared in the Fruit Grower (St. Joseph, Mo., Nov. 1911, page 32). The article was illustrated with a cut of a specimen of the fruit. Early in December, 1911, I visited the original tree near Sherrard, Illinois, and obtained scions. The original tree was cut down in clearing out the brush some time in the winter of 1912-13, so it is fortunate that these scions were saved. As near as I could determine, the original tree of the Mercer (Fluke) wild crab was within about four miles of this place, but it had been grubbed out of the open pasture of native timber where it was found. In color and quality the fruit of the Giant is much like the other large wild crabs, such as Soulard and Mercer, and will be useful mainly for jelly, or for adding a quince-like flavor to common apple sauce.

Trees, one year old budded on Siberian crab (*Pyrus baccata*) apple roots. Each 50 cents.

TETONKAHA ROSE

Offered for first time in the spring of 1912. A seedling of the wild prairie rose from Lake Tetonkaha about eighteen miles northwest of this station, crossed with the pollen of the Siberian Rose rugosa, so that it is a combination of at least three species. In the 100 seedlings obtained from the cross, 74 were double and 26 single; all deep pink, very fragrant. The stock offered consists of root sprouts from these 26 original double flowered seedlings. The flowers are fully 3 inches in diameter; the bush is perfectly hardy, flowering abundantly in June; about 18 to 25 petals, deep rich pink; very fragrant; appears desirable for dwarf hedges or as an ornamental shrub. The habit is more upright and the flowers are less concealed by the foliage than in the pure *Rosa rugosa*. This Tetonkaha rose proves absolutely hardy and very desirable in many places. It is a very free bloomer. Plants of strong growth and as they sprout freely it should not be necessary to propagate on tender commercial stocks or from cuttings.

Plants, 50 cents each.

ROSA RUGOSA

The well known beautiful hardy rose with dark crimson single flowers up to four inches in diameter. Attractive ornamental in autumn and early winter with large bright red fruits, which are used, with seeds removed, for food in its native home. Our own importation, descended from the original introduction from Siberia by the Imperial Botanical Gardens, at Petrograd, Russia. The Siberian form of this species is superior to the Japanese form.

Small one year plants, 2 for 50 cents.

SIBERIAN ALMOND

Amygdalus nana L. A desirable dwarf ornamental shrub from the dry steppes of Siberia, with abundant, bright, rose pink flowers, among the very first to bloom in the spring. Good in front of other shrubs. Raised from our own importations from Siberia.

Small one year plants, 2 for 50 cents.

MANITOBA HAZELNUT

Ornamental as well as useful. The need is apparent of a nut bearing shrub for the open prairie. We now have the wild native hazelnut of Manitoba in the third generation under cultivation. Can spare a few one year old plants at 3 plants for \$1.00.

A New Muskmelon



HANSEN'S SIBERIAN MUSKMELON NO. 3

Offered first in spring 1917. Seed obtained on my 1913 trip to the Semipalatinsk Province, Siberia. The skin yellow, flesh white. Specimen illustrated weighs 11 pounds, and was shown at the South Dakota State Fair at Huron, September, 1916. This melon is very early and productive. As tested on sandy soil in Siberia the quality was delicious. Here on the heavy black soil the quality varies, some being good, others not so good. The quality of a muskmelon depends somewhat on the soil. Those who do not like the flavor should try some sliced and fried in batter. Price of seed, packet of about 150 seeds, 25 cents.

WATERMELON, HANSEN'S SIBERIAN NO. 3

A smooth, round, dark green, very early watermelon with sweet, red flesh. I found this in cultivation in the dry steppe region of Semipalatinsk, Siberia, in 1913. Seed grown at this station 1917. To get a sure stand from a few seeds, plant one seed each in a pot and transplant with ball of earth.

Packet of 10 seeds, 25 cents.

Natural Hybrid Alfalfas

In my bulletin 141, I made the following statement: In Asia and southern Europe wherever the common blue-flowered alfalfa and the yellow-flowered alfalfa grow near together, the pollen is carried from one to the other by bees and other insects so that hybridization takes place freely. These hybrid alfalfas are sometimes called Sand Lucerns. Their number is legion and they consist of all sorts of mixtures in varying proportions of the yellow and blue alfalfas.

Since *Medicago falcata* is very widely distributed in Europe and Asia, ranging in Asia from India north to above the Arctic Circle in Northeast Siberia, the plant varies greatly in its ability to resist cold, hence it follows that hardiness of this hybrid alfalfa must depend largely on the region from which it comes. Coming from the mild regions of South Europe it could not be expected to be as hardy as if it came from drier and more severe climates. Hence while nature has indicated in the Sand Lucerns a method of increasing the vigor of alfalfa by hybridization, we don't know what combination is the best one that is possible to make. I now have at the Experiment Station at Brookings a large cosmopolitan collection of alfalfas and hope in the near future to originate still better varieties combining the best points of the alfalfas of the world.

Cossack Alfalfa

1916 CROP, 1,000 BUSHELS SEED

The strongest and best one of these hybrid alfalfas is the one I have named Cossack, noted in bulletins 159 and 167. The Chernob Alfalfa, sister plant of the Cossack, has been consolidated with the Cossack as it is not possible to distinguish between them. The small spoonful of seed which I brought home from Russia in 1906 and named Cossack has been developed in the hands of many farmers so that the 1916 crop in the western part of South Dakota was fully One Thousand Bushels. In 1917 the crop of seed was reduced by crickets and grasshoppers.

Buyers for the leading seedsmen have been busy in these fields and the seed is now being offered. Many farmers have found by their own experience that Cossack is the heaviest and best seeder of any alfalfa they have ever tested. Seedsmen are ready to handle many car loads more as soon as available. The dry seasons of 1911, 1912, 1913, demonstrated the value of Cossack. Very favorable reports of the Cossack come from many sections, including the far north west prairie region of Saskatchewan, Canada. We have only a few pounds of Cossack seed available for the special experimenters who wish to get their start from the original stock. Price, \$2.00 per pound.

Our Cossack plants are only half size this year because the seed got planted too thick, hence they are priced accordingly. Plants, one pound, (Containing about 100 plants,) 30 cents; 10 pounds for \$2.00.

Some New Alfalfas

HANSEN'S HYBRID ALFALFA NO. 1

Offered for the first time. This variety was produced by transplanting the Semipalatinsk alternately with my Select Turkestan S. P. I. 20711. The latter is characterized by wonderfully tall erect habit of growth. The seed was saved of the Semipalatinsk plants and instead of producing yellow flowers, I find that the work of hybridizing is practically finished as fully 86 per cent of the plants come strongly variegated in many colors. Only 14 per cent come with yellow flowers, which is the normal color of the Semipalatinsk. This original seed was sown in 1915 at the rate of 4 pounds per acre in 18-inch drills which we found was much too thick. The crop of 1916 was 7,200 pounds of hay on 1.4 acres in one cutting. The yield was really heavier but the frequent rains prevented getting all the crop. Owing to lack of room it is deemed best to offer plants to experimenters elsewhere. Price of seed, one ounce for one dollar.

HANSEN'S WHITE FLOWERED ALFALFA

While the hybrid alfalfas with the variegated flowers have shown wonderful hardiness and productiveness, it would be an advantage if they could be bred with definite outstanding characteristics by which they could be readily recognized. For example, an alfalfa with white flowers would have in its color a distinctive trade mark that would protect against misbranding and substitution in the sale of seed. This would be much the same as the Hereford cattle breeders putting a white face on their breed to serve as a trade mark. Holstein cattle are known by the black and white color, Hampshire swine are known by the white belt. Many other cases might be mentioned. In the case of alfalfa it would be difficult to keep this seed pure, even after the type is fixed, since the flowers cross-fertilize so readily. But it could be done by suitable care as to the location of seed plantations. The Cossack alfalfa exhibits strong tendency to light-colored variegation, and even to pure white flowers. For several years I have been endeavoring to select a white flowered alfalfa that would also be as hardy and productive as any of the others. Some of my correspondents report white flowers in the new alfalfas but that the colors do not come true. It is evident that careful selection must be practiced.

The variety here offered distinguishes itself by strong upright growth and productiveness both as to forage and seed. It is a beginning only. In 1916 we found that the seed came fully 70 per cent true to the white color, but the work may easily be completed. Owing to lack of room the seed is now offered to experimenters elsewhere. The seed may be sown in rows and the plants transplanted after one year's growth as described in my bulletin 167. The plants that do not come true as to white color of flowers should be removed as soon as they show the off color. This variety originated as a seedling of the yellow-flowered alfalfa, *Medicago falcata*, from Omsk, Siberia, grown closely adjacent to the Cossack.

Offered for the first time, spring 1917. Price per packet of about 100 seeds, 50 cents.

ORENBURG ALFALFA

From the dry steppes of Orenburg province, Russia. Described in bulletin 141. Flowers yellow. Many farmers express their great interest in this plant since it is a good yielder of excellent hay and has a remarkable habit of forming new crowns from the rhizomes or outlying roots. In this original stock some blue-flowered and hybrid plants are found. This is from near the northern limits of the blue flowered alfalfa in Asia. We have no plants but a small amount of seed from the original plantation at \$1.00 per ounce.

TRANSPLANTING ALFALFA

My machine method of transplanting alfalfa, first noted in bulletin 141 and later in bulletin 159, has now been brought up to date in

bulletin 167 which can be obtained upon application. It is a special method for the quick production of seed. It is interesting to note that, aside from small lots, the first large lot, one thousand pounds of Cossack alfalfa seed, was raised in 1913 by machine transplanting. By transplanting, one pound of seed is sufficient for twenty acres. Instead of the old method of twenty pounds for one acre. When fully standardized and perfected, I believe it will be the means of reclaiming millions of acres of dry western uplands where present varieties and methods have been found unequal to the task.

SEMPALATINSK ALFALFA

Described in bulletin 141 and 167. From the dry steppes of Semipalatinsk, Siberia. Some of the farmers who have had excellent results with this alfalfa on the driest uplands of the west now abbreviate this word to Semi. A variety of great vigor and especially adapted to transplanting into cultivated rows. It is not at its best the first season as it first makes its remarkable root system. It does its own subsoiling on hardpan. Flowers yellow. I find this to be the strongest in growth of all the varieties of *Medicago falcata*. Seed \$2.00 per pound; one-half pound for \$1.00.

TERMS

Cash with order. Add 25 cents for moss and packing for orders less than \$3.00. This money helps to pay for field labor and enables this Department to carry on the work of Plant Breeding on a larger scale than would otherwise be possible.

PROF. N. E. HANSEN,
State College, Brookings, South Dakota.

Special Offer--Double Value for Your Money

LIST OF FREE PREMIUMS

Offered by the South Dakota State Horticultural Society Until
May 1, 1918.

The Legislature has made this Society the Department of Horticulture for South Dakota and has fixed the price of annual ~~membership~~ ^{premium} at \$1.00. The reports are published by the state, but ~~from~~ ^{from} the State Official list, the report is sent only to members. This provides a fund to help pay the running expenses of the Society.

The Society wishes to increase its membership.

As a free premium, select One Dollar's worth of seeds, plants or trees from the foregoing list. The order must be received before May 1, 1918. As the supply of some of these premiums is very limited, mark your second choice. One of the annual reports will be sent you at once. One book and one free premium amounting to One Dollar, will be sent postpaid for each \$1.00 received. Here is a good chance to get a valuable library of books on South Dakota trees, fruit and gardening.

BOOK PREMIUMS

In place of seed and plant premiums, the following are offered. But the offer may be withdrawn at any time without notice, so hurry up your order:

Select ONE of the following list for each annual membership:

- No. 1. 1 back volume of the Annual Report of this society.
- No. 2. Vegetable Gardening, 246 pages, paper cover, by the late Prof. S. B. Green, University of Minnesota.
- No. 3. Popular Fruit Growing, 323 pages, paper cover, by the late Prof. S. B. Green.
- No. 4. Evergreens, "How I Grow Them," 95 pages, paper cover, by C. S. Harrison, and "Windbreaks and Shelter Belts," 69 pages, paper cover, by the late Prof. S. B. Green.

SPECIAL OFFER UNTIL MAY 1, 1918

The life membership is fixed by the Legislature at Ten Dollars. It is highly desirable that the Society has more life members as they are our permanent source of strength and influence. Residents of South Dakota who become life members may select Ten Dollars worth of trees, plants, seeds or other premiums from this circular as a free premium. This includes a set of the 13 annual reports now issued, as far as available, and one annual report as issued. All premiums sent by express at customer's expense.

Address, PROF. N. E. HANSEN,
Secretary South Dakota State Horticultural Society,
Brookings, South Dakota.